

REMARKS

The office action cites a number of references. It is believed that it is conceded that Ovshinsky does not teach the buried line of claim 11 in which the buried line includes a pair of more lightly doped regions around a more heavily doped region. For this element, the Examiner relies on Chang.

However, Chang merely teaches a more heavily doped region and what the Examiner considers a more lightly doped region underneath. The Examiner suggests that because Chang teaches the use of a more lightly doped region reduces leakage current, that this would provide the rationale to modify Chang to put a more lightly doped region on top of the more heavily doped region.

The problem is that, in reviewing Chang, one can see that there is no way to do what only the Examiner proposes. Referring to Figure 2B, Chang teaches the formation of the more heavily doped regions 32 by ion implantation of N⁺ type impurities. That ion implantation is then followed by the ion implantation of N-type impurities, to form the regions 38 under the regions 32, as shown in Figure 2C. For the first implantation, Chang suggests using arsenic at a dosage between 10^{15} and about 10^{16} atoms/cm² and at an energy between 40 and 80 KeV. Conversely, for the second implantation, he suggests using phosphorus at a dosage between 10^{14} and 10^{15} atom/cm² and at an energy between 40 and about 120 KeV. Presumably, the idea is to cause the more rapidly moving phosphorus atoms to move down below and deeper than the arsenic atoms.

But what is missing is any technique to enable the formation of a more lightly doped region on top of the more heavily doped region. It simply would not work with anything Chang shows.

One example of how to form such a structure is described at the top of page 6 of the specification. A P-type and N-type implant are used to form the buried word line 22 and the overlying P⁺ region 20. These implants may be followed by one or more additional implants to create the profile shown in Figure 3.

Chang does the opposite approach. After forming the N⁺ and N type regions 32 and 38, he does a light P⁺ implant, as shown in Figure 2D, to generate the P⁺ region on top of the N⁺ region and within the N⁺ region. Thus, Chang not only teaches away from the claimed invention, he does not provide the tools to meet the elements of the claimed invention.

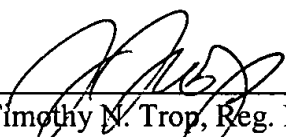
To suggest that it would be obvious to do what Chang did not do cannot be the case because 1) Chang never suggests any reason to provide the more lightly doped region on top of the more heavily doped region and 2) Chang does not provide any technique to do so. Moreover, the technique provided by Chang simply would not work to teach the structure proposed by the Examiner.

Chang teaches away because he teaches the P+ region right on top of the N+ region. There simply is no reason to believe that Chang would suggest the solution claimed when Chang himself does not use it. How can Chang teach modifying his own reference to do something that he simply did not and could not do with the techniques described?

The rejection comes down to the assertion that doing what the reference did not do would be obvious because of what the reference did do. But, particularly, in the case where the reference does not disclose any technique that would be suitable for implementing the modification proposed by the Examiner, a *prima facie* case of obviousness is not made out. Moreover, the case is further mitigated because here the Chang reference suggests using the lighter doped region on one side to reduce leakage, but does not either appreciate or was not able to provide the lighter doped region on the opposite side to reduce leakage. To suggest that his failure to do so renders the claimed invention obvious fails to make out a *prima facie* rejection.

Respectfully submitted,

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